Screening High-Risk Women Veterans for Breast Cancer

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Background: Within the US Department of Veterans Affairs (VA), breast cancer prevalence has more than tripled from 1995 to 2012. Women veterans may be at an increased breast cancer risk based on service-related exposures and posttraumatic stress disorder (PTSD).

Methods: Women veterans aged ≥ 35 years with no personal history of breast cancer were enrolled at 2 urban VA medical centers. We surveyed women veterans for 5-year and lifetime risks of invasive breast cancer using the Gail Breast Cancer Risk Assessment Tool (BCRAT). Data regarding demographicstics, PTSD status, eligibility for chemoprevention, and genetic counseling were also collected. Descriptive statistics were used to determine results.

Results: A total of 99 women veterans participated, of which 60% were Black. In total, 35% were high risk with a 5-year BCRAT > 1.66%. Breast biopsies had been performed in 22% of our entire population; 57% had a family history positive for breast cancer. Comparatively, in our high-risk Black population, 33% had breast biopsies and 94% had a family history. High-risk patients were referred for chemoprevention; 5 accepted and 13 were referred for genetic counseling. PTSD was present in 31% of the high-risk subgroup.

Conclusions: A high percentage of Black patients participated in this pilot study, which also showed an above average rate of PTSD among women veterans who are at high risk for developing breast cancer. Historically, breast cancer rates among Black women are lower than those found in the general population. High participation among Black women veterans in this pilot study uncovered the potential for further study of this population, which is otherwise underrepresented in research. Limitations included a small sample size, exclusively urban population, and self-selection for screening. Future directions include the evaluation of genetic and molecular mutations in high risk Black women veterans, possibly even a role for PTSD epigenetic changes.

The number of women seeking care from the Veterans Health Administration (VHA) is increasing.1 In 2015, there were 2 million women veterans in the United States, which is 9.4% of the total veteran population. This group is expected to increase at an average of about 18,000 women per year for the next 10 years.2 The percentage of women veterans who are US Department of Veterans Affairs (VA) users aged 45 to 64 years rose 46% from 2000 to 2015.1,3-4 It is estimated that 15% of veterans who used VA services in 2020 were women.1 Nineteen percent of women veterans are Black.1 The median age of women veterans in 2015 was 50 years.5 Breast cancer is the leading cancer affecting female veterans, and data suggest they have an increased risk of breast cancer based on unique service-related exposures.1,6-9

In the US, about 10 million women are eligible for breast cancer preventive therapy, including, but not limited to, medications, surgery, or lifestyle changes.10 Secondary prevention options include change in surveillance that can reduce their risk or identify cancer at an earlier stage when treatment is more effective. The United States Preventive Services Task Force, the National Comprehensive Cancer Network, the American Society for Clinical Oncology, the National Institute for Health and Care Excellence, and the Oncology Nursing Society recommend screening women aged ≥ 35 years to assess breast cancer risk.11-18 If a woman is at increased risk, she may be a candidate for chemoprevention, prophylactic surgery, and possibly an enhanced screening regimen.

Urban and minority women are an understudied population. Most veterans (75%) live in urban or suburban settings.19,20 Urban veteran women constitute an important potential study population.

Chemoprevention measures have been underused because of factors involving both women and their health care providers. A large proportion of women are unaware of their higher risk status due to lack of adequate screening and risk assessment.21,22 In addition to patient lack of awareness of their high-risk status, primary care physicians are also reluctant to prescribe chemopreventive agents due to a lack of comfort or familiarity with the risks and benefits.23-26 The STAR2015, BCPT2005, IBIS2014, MAP3 2011, IBIS-I 2014, and IBIS II 2014 studies clearly demonstrate a 49 to 62% reduction in risk for women using chemoprevention such as selective estrogen receptor modulators or aromatase inhibitors, respectively.27-32 Yet only 4 to 9% of high-risk women not enrolled in a clinical trial are using chemoprevention.33-39

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Breast Cancer

The possibility of developing breast cancer also may be increased because of a positive family history or being a member of a family in which there is a known susceptibility gene mutation. Based on these risk factors, women may be eligible for tailored follow-up and genetic counseling.

Nationally, 7 to 10% of the civilian US population will experience posttraumatic stress disorder (PTSD). The rates are remarkably higher for women veterans, with roughly 20% diagnosed with PTSD. Anxiety and PTSD have been implicated in poor adherence to medical advice.

In 2014, a national VA multidisciplinary group focused on breast cancer prevention, detection, treatment, and research to address breast health in the growing population of women veterans. High-risk breast cancer screenings are not routinely carried out by the VA in primary care, women’s health, or oncology services. Furthermore, the recording of screening questionnaire results was not synchronized until a standard questionnaire was created and approved as a template by this group in the VA electronic medical record (EMR) in 2015.

Several prediction models can identify which women are at an increased risk of developing breast cancer. The most commonly used risk assessment model, the Gail breast cancer risk assessment tool (BCRAT), has been refined to include women of additional ethnicities. This pilot project was launched to identify an effective manner to screen women veterans regarding their risk of developing breast cancer and refer them for chemoprevention education or genetic counseling as appropriate.

METHODS

A high-risk breast cancer screening questionnaire based on the Gail BCRAT and including lifestyle questions was developed and included as a note template in the VA EMR. The James J. Peters VA Medical Center, Bronx, NY (JJPVAMC) and the Washington DC VA Medical Center (DC-VAMC) ran a pilot study between 2015 and 2018 using this breast cancer screening questionnaire to collect data from women veterans. Quality Executive Committee and institutional review board approvals were granted respectively.

Eligibility criteria included women aged ≥ 35 years with no personal history of breast cancer. Most patients were self-referred, but participants also were recruited during VA Breast Cancer Awareness month events, health fairs, or at informational tables in the hospital lobbies.

After completing the 20 multiple choice questionnaire with a study team member, either in person or over the phone, a 5-year and lifetime risk of invasive breast cancer was calculated using the Gail BCRAT. A woman is considered high risk and eligible for chemoprevention if her 5-year risk is > 1.66% or her lifetime risk is ≥ 20%. Eligibility for genetic counseling is based on the Breast Cancer Referral Screening Tool, which includes a personal or family history of breast or ovarian cancer and Jewish ancestry.

All patients were notified of their average or high risk status by a clinician. Those who were deemed to be average risk received a follow-up letter in the mail with instructions (eg, to follow-up with a yearly mammogram). Those who were deemed to be high risk for developing breast cancer were asked to come in for an appointment with the study principal investigator (a VA oncologist/breast cancer specialist) to discuss prevention options, further screening, or referrals to genetic counseling. Depending on a patient’s other health factors, a woman at high risk for developing breast cancer also may be a candidate for chemoprevention with tamoxifen, raloxifene, exemestane, anastrozole, or letrozole.

### TABLE 1 Study Population Demographics and Site Locations

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Female, No.</th>
<th>DCVAMC, No.</th>
<th>JJPVAMC, No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>99</td>
<td>36</td>
<td>63</td>
</tr>
<tr>
<td>Age, mean, y</td>
<td>54</td>
<td>50.9</td>
<td>55.2</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White</td>
<td>14</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Black</td>
<td>59</td>
<td>24</td>
<td>35</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>13</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

Abbreviations: DCVAMC, Washington DC Veterans Affairs Medical Center; JJPVAMC, James J. Peters Veterans Affairs Medical Center, Bronx, NY.
Data on the participant’s lifestyle, including exercise, diet, and smoking, were evaluated to determine whether these factors had an impact on risk status.

RESULTS

The JJP and DC VAMCs screened 103 women veterans between 2015 and 2018. Four patients were excluded for nonveteran (spousal) status, leaving 99 women veterans with a mean age of 54 years. The most common self-reported races were Black (60%), non-Hispanic White (14%), and Hispanic or Latino (13%) (Table 1).

Women veterans in our study were nearly 3-times more likely than the general population were to receive a high-risk Gail Score/BCRAT (35% vs 13%, respectively). Of this subset, 46% had breast biopsies, and 86% had a positive family history. Thirty-one percent of Black women in our study were high risk, while nationally, 8.2 to 13.3% of Black women aged 50 to 59 years are considered high risk. Of the Black high-risk group with a high Gail/BCRAT score, 94% had a positive family history, and 33% had a history of breast biopsy (Table 2).

Of the 35 high-risk patients (74%) patients accepted consultations for chemoprevention and 5 (19%) started chemoprevention. Of this high-risk group, 13 (37%) patients were referred for genetic counseling (Table 3). The prevalence of PTSD was present in 31% of high-risk women and 29% of the cohort (Figure). The lifestyle questions indicated that, among all participants, 79% had an overweight or obese body mass index; 58% exercised weekly; 51% consumed alcohol; 14% were smokers; and 21% consumed 3 to 4 servings of fruits/vegetables daily.

DISCUSSION

Breast cancer is the most common cancer in women. The number of women with breast cancer in the VHA has more than tripled from 1995 to 2012. The lifetime risk of developing breast cancer in the general population is about 13%. This rate can be affected by risk factors including age, hormone exposure, family history, radiation exposure, and lifestyle factors, such as weight and alcohol use. In the United States, invasive breast cancer affects 1 in 8 women.

Our screened population showed nearly 3 times as many women veterans were at an increased risk for breast cancer when compared with historical averages in US women. This difference may be based on a high rate of prior breast biopsies or positive family history, although a provocative study using the Surveillance, Epidemiology, and End Results database showed military women to have higher rates of breast cancer as well. Historically, Blacks are vastly understudied in clinical research with only 5% representation on a national level. The urban locations of both

<p>| TABLE 2 Presence of Risk Factors for Breast Cancer and Posttraumatic Stress Disorder |
|---------------------------------|---------|--------------|-----------------|-------------------|-------------------|</p>
<table>
<thead>
<tr>
<th>Populations</th>
<th>No.</th>
<th>Age, Mean, y</th>
<th>Breast Biopsy, %</th>
<th>Family history of Breast Cancer, %</th>
<th>Posttraumatic Stress Disorder, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>99</td>
<td>54</td>
<td>22</td>
<td>57</td>
<td>29</td>
</tr>
<tr>
<td>High-risk Gail score (&gt; 1.66)</td>
<td>Total</td>
<td>35</td>
<td>57</td>
<td>46</td>
<td>86</td>
</tr>
<tr>
<td>Black</td>
<td>18</td>
<td>58</td>
<td>33</td>
<td>94</td>
<td>28</td>
</tr>
<tr>
<td>US population40,41,45-47</td>
<td></td>
<td></td>
<td>7-17</td>
<td>11-13</td>
<td>8-10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TABLE 3 Intervention Acceptance for High-Risk Patients (N = 99)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-risk Gail score (&gt; 1.66)</td>
</tr>
<tr>
<td>No.</td>
</tr>
<tr>
<td>---------------------------------</td>
</tr>
<tr>
<td>Total population</td>
</tr>
<tr>
<td>Black</td>
</tr>
</tbody>
</table>

Of the 35 high-risk patients 26 (74%) patients accepted consultations for chemoprevention and 5 (19%) started chemoprevention. Of this high-risk group, 13 (37%) patients were referred for genetic counseling (Table 3). The prevalence of PTSD was present in 31% of high-risk women and 29% of the cohort (Figure). The lifestyle questions indicated that, among all participants, 79% had an overweight or obese body mass index; 58% exercised weekly; 51% consumed alcohol; 14% were smokers; and 21% consumed 3 to 4 servings of fruits/vegetables daily.
Breast Cancer

pilot sites (Washington, DC and Bronx, NY) allowed for the inclusion of minority patients in our study. We found that the rates of breast cancer in Black women veterans to be higher than seen nationally, possibly prompting further screening initiatives for this understudied population.

Our pilot study’s chemoprevention utilization (19%) was double the < 10% seen in the national population.33-35 The presence of a knowledgeable breast health practitioner to recruit study participants and offer personalized counseling to women veterans is a likely factor in overcoming barriers to chemopreventive acceptance. These participants may have been motivated to seek care for their high-risk status given a strong family history and prior breast biopsies.

Interestingly, a 3-fold higher PTSD rate was seen in this pilot population (29%) when compared with PTSD rates in the general female population (7-10%) and still one-third higher than the general population of women veterans (20%).45-47 Mental health, anxiety, and PTSD have been barriers to patients who sought treatment and have been implicated in poor adherence to medical advice.48,49 Cancer screening can induce anxiety in patients, and it may be amplified in patients with PTSD. It was remarkable that although adherence with screening recommendations is decreased when PTSD is present, our patient population demonstrated a higher rate of screening adherence.

Women who are seen at the VA often use multiple clinical specialties, and their EMR can be accessed across VA medical centers nationwide. Therefore, identifying women veterans who meet screening criteria is easily attainable within the VA.

When comparing high-risk with average risk women, the lifestyle results (BMI, smoking history, exercise and consumption of fruits, vegetables and alcohol) were essentially the same. Lifestyle factors were similar to national population rates and were unlikely to impact risk levels.

Limitations
Study limitations included a high number of self-referrals and the large percentage of patients with a family history of breast cancer, making them more likely to seek screening. The higher-than-average risk of breast cancer may be driven by a high rate of breast biopsies and a strong family history. Lifestyle metrics could not be accurately compared to other national assessments of lifestyle factors due to the difference in data points that we used or the format of our questions.

CONCLUSIONS
As the number of women veterans increases and the incidence of breast cancer in women veterans rise, chemoprevention options should follow national guidelines. To our knowledge, this is the only oncology study with 60% Black women veterans. This study had a higher participation rate for Black women veterans than is typically seen in national research studies and shows the VA to be a germane source for further understanding of an understudied population that may benefit from increased screening for breast cancer.

A team-based, multidisciplinary model that meets the unique healthcare needs of women veterans results in a patient-centric delivery of care for assessing breast cancer risk status and prevention options. This model can be replicated nationally by directing primary care physicians and women’s health practitioners to a risk-assessment questionnaire and referring high-risk women for appropriate preventative care. Given that these results show chemoprevention adherence rates doubled those seen nationally, perhaps techniques used within this VA pilot study may be adapted to decrease breast cancer incidence nationally.

FIGURE High Risk Patient Population Use of Preventative Measures
Since the rate of PTSD among women veterans is triple the national average, we would expect adherence rates to be lower in our patient cohort. However, the multidisciplinary approach we used in this study (eg, 1:1 consultation with oncologist; genetic counseling referrals; mental health support available), may have improved adherence rates. Perhaps the high rates of PTSD seen in the VA patient population can be a useful way to explore patient adherence rates in those with mental illness and medical conditions.

Future research with a larger cohort may lead to greater insight into the correlation between PTSD and adherence to treatment. Exploring the connection between breast cancer, epigenetics, and specific military service-related exposures could be an area of analysis among this veteran population exhibiting increased breast cancer rates. VAMCs are situated in rural, suburban, and urban locations across the United States and offers a diverse socioeconomic and ethnic patient population for inclusion in clinical investigations. Women veterans make up a small subpopulation of women in the United States, but it is worth considering VA patients as an untapped resource for research collaboration.

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Author disclosures
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The opinions expressed herein are those of the authors and do not necessarily reflect those of Federal Practitioner, Frontline Medical Communications Inc., the US Government, or any of its agencies.

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